

### **DETAILED ACTION**

#### **Introduction**

1. Claims 4-6 of U.S. Application 10/542,490, filed 7/15/2005, are pending.

### **EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee. This amendment was made in the interests of compact prosecution. In claim 4, on the last line of page 2 of the amendment of 1/9/2008:

Insert a semicolon --;-- after the word "layer".

See (claim 1):

~~- iteratively changing the form of the interface to minimize the pressure jump, until the pressures on either side of jump is below a defined critical value in at least one part of the interface become equal in any point of this part, the part defining the at least one layer~~ 

#### ***Allowable Subject Matter***

3. The following is an examiner's statement of reasons for allowance:

Claims 4-6 are allowed since when reading the claims in light of the specification, as per MPEP §2111.01, none of the references of record alone or in combination

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disclose or suggest the combination of limitations specified in independent claim 4, particularly including the following limitations as arranged in the claim:

a) selecting at least one layer of the stratified hydrocarbon reservoir  
where an interface between the fluid in place and a flushing fluid moves in a  
stationary manner, the interface separating an upstream zone and a  
downstream zone by:

b) modifying the said reservoir model by assigning mean hydrodynamic  
properties uniformly to each zone of the hydrocarbon reservoir delimited by  
each interface part, when said equilibration is reached (the at least one layer;

c) determining a viscosity of the flushing fluid which allows to optimize  
the recovery, by selecting the viscosity which optimize the stationary  
displacements in said hydrocarbon reservoir, by using the said model, and

Furthermore, Applicant's argument on pp. 5-6 is persuasive:

<sup>19</sup>  
The example given by the Examiner in numbered sections 8 and 9 of the Office Action is not applicable to a stratified porous medium, it is only applicable to fluid directly in contact, such as a bubble (see Summary). The method of Popinet is dedicated to problems involving a moving interface in a multiphase fluid flow (see introduction of Popinet). In this context, the motion of fluids is described by the Navier-Stokes equations. These are the used by Popinet. In the context of stratified porous medium, the motion of fluids is described by the Darcy equation

The Examiner notes the terms "porous" and "Darcy equation" are not recited in the claims. However, the use of "stratified hydrocarbon reservoir" in the claim tells one skilled in the art that the medium is porous and that the Darcy equation is used rather than Navier and Stoke. It can be found in all literature concerning oil and gas industry.

4. The 101 rejections are withdrawn in view of the amendment.
5. The 112 rejections are withdrawn upon reconsideration.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

7. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to: Hugh Jones telephone number (571) 272-3781,

Monday-Thursday 0830 to 0700 ET,

or

the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

**mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 308-9051 (for formal communications intended for entry)

or (703) 308-1396 (for informal or draft communications, please label *PROPOSED* or *DRAFT*).

/Hugh Jones/  
Primary Patent Examiner  
May 27, 2008